REMARKS

Claims 1-20 and 26-27 are pending herein. Claims 21-25 have been cancelled without prejudice or disclaimer. Claim 9 has been withdrawn from consideration. Therefore, Claims 1-8, 10-20 and 26-27 are under review and consideration.

1. Claim 8 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Appropriate amendment has been made by deleting the word "any" in line 7 of Claim 8. Accordingly, the Examiner is respectfully requested to withdraw the rejection.

2. Claims 1-7 and 10-12 were rejected under 35 U.S.C. §102(b) over Sangeetha et al. (Sciences Des Aliments, 2002) for allegedly teaching the method for production of FTase and FOS.

The claims, as presently amended, are drawn to a process of obtaining FOS from *A. pullulans*. However, Sangeetha et al. describe production of FOS from *A. oryzae*. Further, one cannot anticipate that the method used for FOS production from *A. oryzae* (as in Sangeetha et al.) would also work for FOS production from *A. pullulans* (as in the present invention). Additionally, Sangeetha et al. would not prompt a person skilled in the art to use specifically the strain *A. pullulans* for the described process, since the two strains are different from one another. Therefore, the precise process determinants to be used cannot be anticipated, thereby requiring substantial experimentation to elucidate the desired process parameters for the present invention.

3. Claim 8 was rejected under 35 U.S.C. §103(a) over Sangeetha et al. It is respectfully submitted that the two processes are distinct from one another and use completely different strains. In particular, since the present invention is drawn to FOS production using *A. pullulans*, the process is distinct from the one described in the cited reference. Additionally, Sangeetha et al. use medium components that lie outside the range as disclosed in the present invention, e.g., page 286 of Sangeetha et al. discloses concentration ranges of KH_2PO_4 and K_2HPO_4, which are different from those used in the present invention.

4. Claim 10 was rejected under 35 U.S.C. §103(a) over Sangeetha et al. and Vijayendra et al. (Proc. Biochem. 2001).

It is respectfully submitted that Sangeetha et al. do not describe the use of jaggery as a carbon source for FTase production or as a suitable substrate for FTase for FOS production. The Examiner states that Sangeetha et al. teach the use of strain *Aureobasidium pullulans* for FTase production. However, the present invention claims the use of *Aspergillus pullulans*, which is distinct from the one used by Sangeetha et al.

The Examiner further notes that Vijayendra et al. describe jaggery as a substitute for sucrose in *Aureobasidium pullulans* fermentation for production of pullulan, which is materially different from the product of interest described in the present application (FOS). Additionally, Vijayendra et al. mentions on page 361 that "jaggery is a good carbon source to support the growth as well as pullulan production." Further, Vijayendra et al. on page 363 (Conclusions section) describe "*jaggery* as a

substitute of carbon for pigment free pullulans production." Thus, it specifically restricts itself to pullulans production, while maintaining complete silence over the suitability of jaggery as a carbon source for production of FOS. Hence, it does not teach or suggest a person skilled in the art to use jaggery for fermentations involving *Aspergillus pullulans* for FOS production.

In this regard, it is important to note that each cell type requires a unique combination of the medium components (carbon and nitrogen source, growth factors, metal ions, etc.) for the expression of a particular phenotype. Operationally, this means that cells in the original medium have a certain phenotypic repertoire and the medium to which the cells are adapted presents a certain environment that may or may not support production of the desired enzyme, protein or secondary metabolite. Culturing a cell line in a medium lacking desirable traits and components to support the production of a desired secondary metabolite cannot result in high yields. Therefore, a preferred strategy is to systematically take the medium and reorganize the medium components and their concentrations to meet the requirements of the cells for a particular function and this requires substantial experimentation.

It is respectfully submitted that mere disclosure of the suitability of jaggery for pullulan production by *Aureobasidium pullulans* does not in any way motivate a person skilled in the art to use jaggery for the production of FOS by *Aspergillus pullulans.* In other words, one cannot anticipate the requirements of the *Aspergillus* strain of present invention for the production of FOS, based on the mere suitability of jaggery for pullulan

production from *Aureobasidium pullulans*. Therefore, the fact the jaggery works well in *Aureobasidium* fermentation for pullulan production does not in any way render obvious the use of jaggery in *Aspergillus* fermentation for FOS production. In light of the above, a person skilled in the art cannot and would not anticipate use of jaggery for FOS production by combining the teachings of Vijayendra et al. and Sangeetha et al. Accordingly, the Examiner is requested to reconsider and withdraw the rejection.

5. Claims 1 and 10-14 were rejected under 35 U.S.C. §103(a) as being obvious over Sangeetha et al. and Brouwers (US 2002/0065245).

Brouwers discloses the use of stevia extract as a suitable additive to glucooligosaccharide (GOS). However, it is silent over the use of same as an additive for FOS preparation. Moreover, Brouwers also states that stevia has no effect on enzyme activity of GTase. It is important to note that GTase and FTase are completely different enzymes and would, therefore, exhibit a different spectrum of inhibitors. GOS and FOS are composed of monomer units that are distinct from one another and are obtained by the action of different set of enzymes, i.e., are GTase and FTase, respectively. The fact that stevia does not influence or inhibit activity of GTase does not imply that it additionally does not inhibit the activity of FTase.

Brouwers further states that addition of stevia to GOS results in advantages, such as improved taste, digestive qualities, extension of storage life and heat resistance. However, it is silent over extension of such properties upon addition of stevia specifically to FOS. This reference merely mentions addition of the composition

comprising stevia + GOS to a preparation of FOS without explicitly describing the properties of such a composition. One cannot anticipate improvement in FOS properties by adding stevia merely by knowing that properties of GOS are also improved by addition of stevia. It requires substantial experimentation to establish these facts. Therefore, by combining the teachings of Sangeetha et al. and Brouwers, a person skilled in the art would not be motivated to add stevia to FOS in order to improve its properties. Accordingly, the Examiner is requested reconsider and withdraw the rejection.

6. Claims 26 and 27 were rejected under 35 U.S.C. §103(a) as being obvious over Sangeetha et al. and Jonniaux et al. (US 6,518,047).

Jonniaux et al. describe inulinase production from *Penicillium restrictum* A191, wherein the gene is cloned and expressed in *Aspergillus orzyae*. Thus, the *Aspergillus* strain acts only as a suitable recombinant host. The Examiner contends that the claims do not require that the strain not be a recombinant host. However, the fact that Jonniaux et al. use a genetically constructed strain of *A. oryzae* does not suggest in any way that strain from the genus *Aspergillus* (species *oryzae* or *pullulans*) described in the present invention could also naturally express FTase enzyme in the wild type strain without any genetic manipulation. Additionally, as presently amended, the claims are drawn to the strain of *A. pullulans*, not *A. oryzae*.

Further, Jonniaux et al. specifically state immobilization of enzyme or cell extracts as a means of recycling, which is distinct from the present invention. The recycling employed by Jonniaux et al. involves harvesting the biomass once produced and immobilizing it on a solid support. Additionally, the immobilized biomass is used for inulin hydrolysis and Jonniaux et al. remain silent over the precise recycle requirements for production of FOS, as in the present invention. Thus, Jonniaux et al., by employing immobilization method, allow the biomass used to take up the physical characteristics of the support, while retaining its basic biochemical activity. This results in improvement in the handling properties of the enzyme and thus allowing it to be reused.

However, the present invention uses a completely different means of biomass recycling which is totally unrelated to the immobilization technique. The present invention simply uses the cell pellets obtained from first fermentation batch after decanting the culture broth as an inoculum for subsequent fermentation batches (please see Figure 4), without employing the use of any solid support as required by Jonniaux et al.

It is respectfully submitted that there is a significant difference between the methods for recycling as described in the cited reference and in the present invention. In the cited reference, biomass production and reaction phase are distinctly segregated. After biomass production, the cells are harvested and immobilized and thereafter employed in inulin hydrolysis. Thus, biomass production precedes immobilization which is followed by reaction phase (inulin hydrolysis). On the other hand, the present

invention uses the biomass produced in first fermentation batch as an inoculum for the subsequent batch. Thus, the biomass production and recycle phase are not segregated from one another, but in fact coincide. Therefore, a person skilled in the art would not anticipate the success of such a recycle method, as used in present invention, from a completely distinct recycle method disclosed by Jonniaux et al.

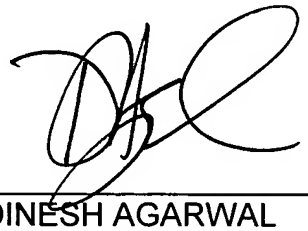
CONCLUSION

For the foregoing reasons, it is respectfully submitted that Claims 1-8, 10-20 and 26-27are in condition for allowance. Withdrawal of all the objections and rejections and allowance of these claims is respectfully solicited.

It is believed that no additional fee is due for this submission. Should that determination be incorrect, however, the Commissioner is hereby authorized to charge any deficiencies, or credit any overpayment, to our Deposit Account No. 01-0433, and notify the undersigned in due course.

Should the Examiner have any questions or wish to discuss further this matter, please contact the undersigned at the telephone number provided below.

Respectfully submitted,



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